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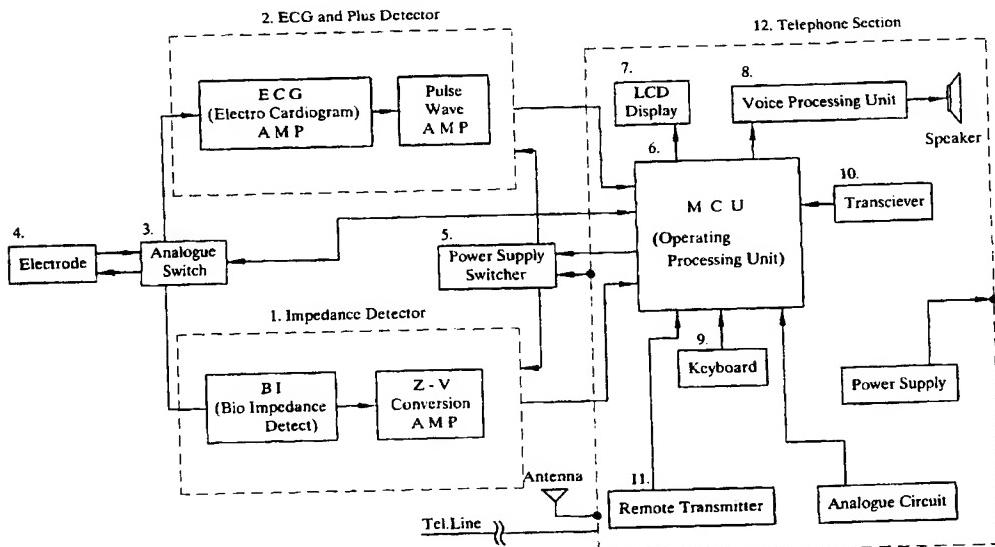
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(54) Title: TELEPHONE PROVIDED WITH BODY COMPOSITION ANALYSIS, ELECTRO CARDIOGRAM AND PULSE MEASUREMENT FUNCTION



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(57) Abstract: The present invention relates to analysis of body composition by means of bioelectrical impedance analysis (BIA) method using an electrode formed integrally or separately to/from a keypad of the telephone, and measurement of electro cardiogram (ECG) and pulse for human body using the principle of ECG without limitation of location and time. The telephone analyzes the percentage of body fat, the amount of body water, the amount of body fat and the degree of obesity by means of BIA method, measures electro cardiogram (ECG) and pulse by means of the principle of ECG and informing the results of a user, when right and left palms of the hand, right and left wrists and fingers of the user touches an electrode installed in the main part of a keypad of the telephone.

**TELEPHONE PROVIDED WITH BODY COMPOSITION ANALYSIS,  
ELECTRO CARDIOGRAM AND PULSE MEASUREMENT FUNCTION**

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**TECHNICAL FIELD**

The present invention relates to addition of the function of analyzing a body composition and of sensing electro cardiogram (ECG) and pulse using various functions attached to the telephone. More particularly, 10 the present invention relates to a telephone having an electrode installed in the main parts of telephones such as the home use telephone, office use telephone, portable telephone, image telephone, mobile communication devices, etc., by which a body composition can be analyzed by 15 means of a bioelectrical impedance analysis (BIA) method, ECG and pulses can be measured based on the principle of ECG without limitation of locations and time, easily and conveniently.

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**BACKGROUND ART**

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Conventionally, in order to measure a body composition, and ECG and pulses of a human body, he/she must visit a medical center (or a hospital) or must purchase equipments for measuring the body composition, ECG and pulses. This method, however, require a lot of time and cost.

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Further, in order to manufacture additional body composition analyzer and an ECG and pulse sensor, additional an operating processing unit, a LCD display, a voice output device, a keypad, etc. are required. Also, a modem for transmitting measured data must be additionally added, which makes the cost of the equipment higher and the construction complicated. Thus, it is difficult for a

user to measuring the body composition, ECG and pulses at home and at work or during movement in order to confirm his/her state of health.

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#### DISCLOSURE OF INVENTION

The present invention is contrived to solve the conventional problems and a main object of the present invention is to provide a telephone having an electrode by which a body composition, and ECG and pulses can be measured, using existing functions and devices of the telephone, without limitation of locations and time easily and conveniently.

Another object of the present invention is to provide a user with a remote diagnosis of a doctor or a specialist on his/her health, by transmitting the results of analyzing the body composition and ECG and pulses of the user via communication equipments such as a modem, a LAN card, etc., which is installed in the telephone.

Still another object of the present invention is to provide a telephone having an electrode installed in the main parts of the telephone, by which a body composition and ECG and pulses can be measured using a power supply switcher, an operating processing unit, a LCD display, a voice processing unit, a keypad, a transceiver, a remote transmitter, etc., without the necessity of additional apparatuses.

Still another object of the present invention is to measure the body composition, and the ECG and pulses of various persons using a single telephone, by giving unique numbers to them and individually storing the numbers in order to assist health management of a family or a group.

In order to accomplish the above object, the present invention provides a telephone by which the percentage of

body fat, the amount of body water, the amount of body fat, the degree of obesity, etc. can be analyzed and the electro cardiogram can be sensed to inform the results of a user, when the right and left palms of the hand and the fingers of the user touch an electrode formed in the main part of the telephone. The telephone can be used at home or at work. Also, the present invention employs the existing functions of a power supply switcher, an operating processing unit, a LCD display, a voice processing unit, a keypad, a transceiver and a remote transmitter.

In the present invention, the BIA method used to analyze the body composition includes flowing a fine current harmless to a human body into the human body and measuring the impedance of the human body to thus analyze the body composition. As a result, important result for preventing and curing such diseases as an obesity, a high-blood pressure, a complication of diabetes, etc. can be obtained by analyzing the body composition. The principle is to analyze the body composition based on the measured impedance, assuming that adipose tissue including body water percentage, an electrolyte, muscles, etc. is used as a conductor and an adipose portion having a low conductivity in the human body is used as an insulator.

Also, in order to accomplish the above object, there is provided a telephone capable of measuring ECG and pulses, in which when the right and left palms and the fingers of a user touch an electrode installed in the main part of the telephone, after a body composition mode, a ECG mode or a pulse measuring mode is selected by a telephone keypad and ID number, height, weight, age and sex are inputted, a human body impedance detector measures the impedance of a human body using BIA method, an

operating processing unit calculates a body composition and a pulse detector detects ECG signals generated in the heart.

Further, in order to accomplish the above object,  
5 there is provided a telephone provided with the functions of analyzing a body composition and measuring ECG and pulse. The telephone includes an impedance detector for measuring the impedance of a human body; an ECG and pulse detector for sensing ECG and pulse based on the principle  
10 of ECG; an analog switch for switching a ECG and pulse measuring mode and a body composition analysis mode; an electrode formed integrally or separately in the main part of the telephone and made of a material having a good conductivity, for detecting ECG and pulse signals, and impedance;  
15 a power supply switcher for selectively supplying the power depending on which one of the impedance detector and the ECG and pulse detector is selected; an operating processing unit for operating the body composition and the ECG and pulses using the impedance measured by the impedance detector, and the ECG and pulse signals measured by the ECG and pulse detector;  
20 a LCD display for displaying the results from the operating processing unit on the screen; a voice processing unit for outputting the result from the operating processing unit as voices via a sound card built  
25 in the telephone and for receiving personal data such as ID number, height, weight, age, sex, etc. as voice; a keypad for inputting ID number, height, weight, age and sex of the user, for switching the measuring mode and for  
30 inputting a telephone number; a transceiver for outputting the results calculated in the operating processing unit as voice via the telephone; a remote transmitter for transmitting the output results to a remote doctor or a

specialist; and a remote controller for controlling the telephone from a remote place.

#### BRIEF DESCRIPTION OF DRAWINGS

5 This invention will be better understood and its various objects and advantages will be more fully appreciated from the following description taken in conjunction with the accompanying drawings, in which:

10 FIG. 1 is a block diagram of a telephone provided with a body composition analysis and an electrocardiogram and pulse measurement function according to one embodiment of the present invention;

15 FIG. 2 illustrates a construction in which an electrode is installed in the main parts of the telephones such as a home use telephone, an office use telephone, an image use telephone, etc. according to one embodiment of the present invention; and

20 FIG. 3 illustrates a construction in which an electrode is installed in the main parts of the portable phone and an image phone according to one embodiment of the present invention.

#### BEST MODE FOR CARRYING OUT THE INVENTION

25 Hereinafter, the invention will be described in detail with reference to the drawings.

FIG. 1 is a block diagram of a telephone provided with a body composition analysis and an electrocardiogram and pulse measurement function according to one embodiment of the present invention; FIG. 2 illustrates a construction in which an electrode is installed in the main parts of the telephones such as a home use telephone, an office use telephone, an image telephone, etc. according to one embodiment of the

present invention; and FIG. 3 illustrates a construction in which an electrode is installed in the main parts of the portable phone and an image phone according to one embodiment of the present invention.

Referring now to Figs, there is shown a telephone provided with the functions of analyzing a body composition and measuring ECG and pulses. An impedance detector 1 measures the impedance of a human body. An ECG and pulse detector 2 detects ECG and pulses based on the principle of ECG. An analog switch 3 functions to switch a ECG mode, a pulse measuring mode or a body compisition analysis mode. There is formed an electrode 4 integrally or separately in or from the telephone. The electrode may be made of a material having a good conductivity. The electrode also functions to detect the ECG and pulse signals and the impedance. A power supply switcher 5 functions to selectively supply the power depending on which one of the impedance detector 1 and the ECG and pulse detector 2 is selected. An operating processing unit 6 operates the body composition and the ECG and pulses, using the impedance measured by the impedance detector 1, and the ECG and pulse signal measured by the ECG and pulse detector 2. A LCD display 7 displays the results from the operating processing unit 6. A voice processing unit 8 outputs the results from the operating processing unit 6 as voices via a speaker. The voice processing unit 8 also receives, as voice, personal data such as ID number, height, weight, age, sex, etc. A keypad 9 provides a means through which ID number, height, weight, age and sex of a user can be inputted and a telephone number can be inputted. Also, the keypad 9 selects a body composition mode, a ECG mode or a pulse measuring mode. A transceiver 10 outputs the results from

the operating processing unit 6 via the telephone as a voice. A remote transmitter 11 transmits the output results of measuring the body composition, the ECG and pulses to remote doctor or specialist. In the drawing, an 5 unexplained reference numeral 12 indicates a telephone section by which the telephone can be used in a remote place.

In the above, it should be noted that the electrode can be attached to various locations depending on the 10 design of the telephone. Also, the BIA method used to measure the body composition may include a dual-pole method, a quad-pole method and other various methods.

As mentioned above, the present invention provides a 15 telephone having an electrode capable of analyzing a body composition, and measuring ECG and pulse of a human body. Therefore, anyone who can use the telephone can easily analyze the body composition and can measure the ECG and pulse. Therefore, the present invention can solve the problem of difficulty in measuring the body composition 20 and the ECG and pulse due to the limitation of time and location. As such, the present invention has an outstanding effect that it allows a user to easily and conveniently confirm the status of his/her health, without the necessity of additional devices. Also, there is an 25 outstanding effect that it allows a user to easily measure the body composition, and the ECG and pulse of his/her during movement using a notebook telephone.

While this invention has been particularly shown and described with reference to particular embodiments 30 thereof, it will be understood by those skilled in the art that various changes in form and details may be effected therein without departing from the spirit and scope of the invention as defined by the appended claims.

## CLAIMS

1. A telephone having an electrode installed in the major parts of telephones such as a home use telephone, an office use telephone, a portable phone, an image phone, a mobile communication device, etc., capable of measuring a body composition and ECG and pulse using functions and devices both of which are built in the telephone, comprising:

10 said telephone analyzing the percentage of body fat, the amount of body water, the amount of body fat and the degree of obesity by means of BIA method when right and left palms of the hand, right and left wrists and fingers touch the electrode, measuring electro cardiogram (ECG) and pulses based on the principle of ECG and informing the results of a user,

15 said telephone including:

an impedance detector 1 for measuring the impedance of a human body;

20 an ECG and pulse detector 2 for detecting ECG and pulse based the principle of ECG;

an analog switch 3 for switching an ECG mode, a pulse measuring mode or a body composition analysis mode;

25 an electrode 4 formed integrally or separately in the main part of the telephone and made of a material having a good conductivity, for detecting ECG, pulse signals and impedance;

30 a power supply switcher 5 for selectively supplying the power depending on which one of said impedance detector 1 and said ECG and pulse detector 2 is selected;

an operating processing unit 6 for processing a body composition and ECG and pulses using the impedance measured by said impedance detector 1 and the ECG and

pulse signal measured by said ECG and pulse detector 2;

a LCD display 7 for displaying the results from the operating processing unit 6;

5 a voice processing unit 8 for outputting the results from said operating processing unit 6 as voices via a sound card built in the telephone and for receiving personal data such as ID number, height, weight, age, sex, etc. as voice;

10 a keypad 9 by which ID number, height, weight, age and sex of a user and a telephone number are inputted, for selecting a body composition mode, a ECG mode or a pulse measuring mode;

15 a transceiver 10 for outputting the results from the operating processing unit 6 via the telephone as a voice;

a remote transmitter 11 for transmitting the output result to a remote specialist; and

a remote controller 12 for allowing a user to use the telephone.

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2. The telephone according to claim 1, wherein said measured body composition and said ECG and pulses are transmitted to a remote location so that a doctor can remotely diagnose the health state of the user.

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3. The telephone according to claim 1, wherein the results of measuring the body composition and the ECG and pulse of several persons are individually stored by individually giving unique numbers.

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4. The telephone according to claim 1, wherein said LCD display 7 selectively displays a portion of the percentage of body fat, the amount of body water, the

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amount of body fat and the degree of obesity when measuring the body composition.

5. The telephone according to claim 1, further including RS-232C for transmitting the weight from an external weight machine to the telephone.

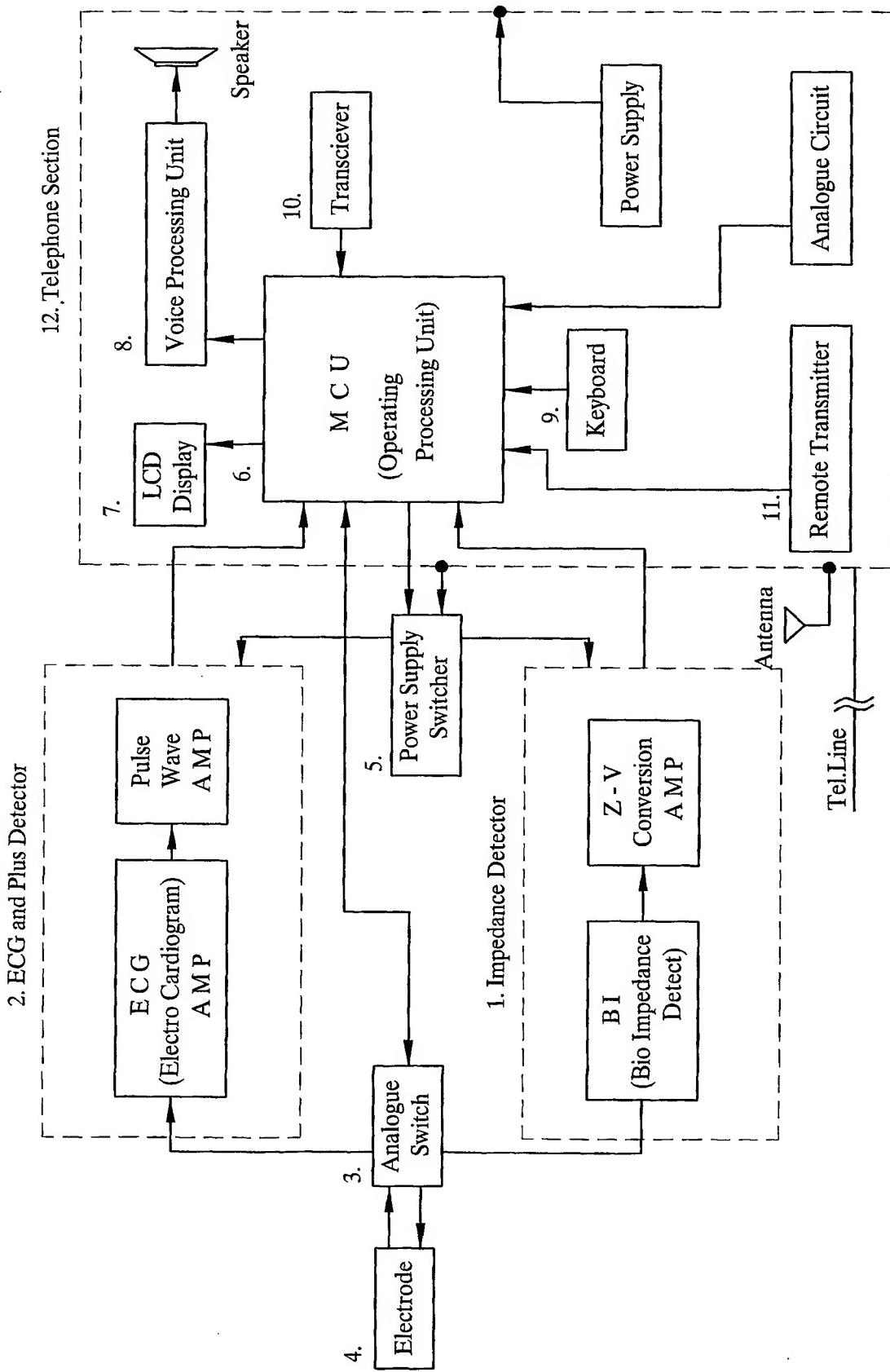
10. The telephone according to claim 1, wherein personal data such as the ID number, height, weight, age and sex of a user are inputted as a voice.

7. The telephone according to claim 1, further including an independent electrode connected to said telephone.

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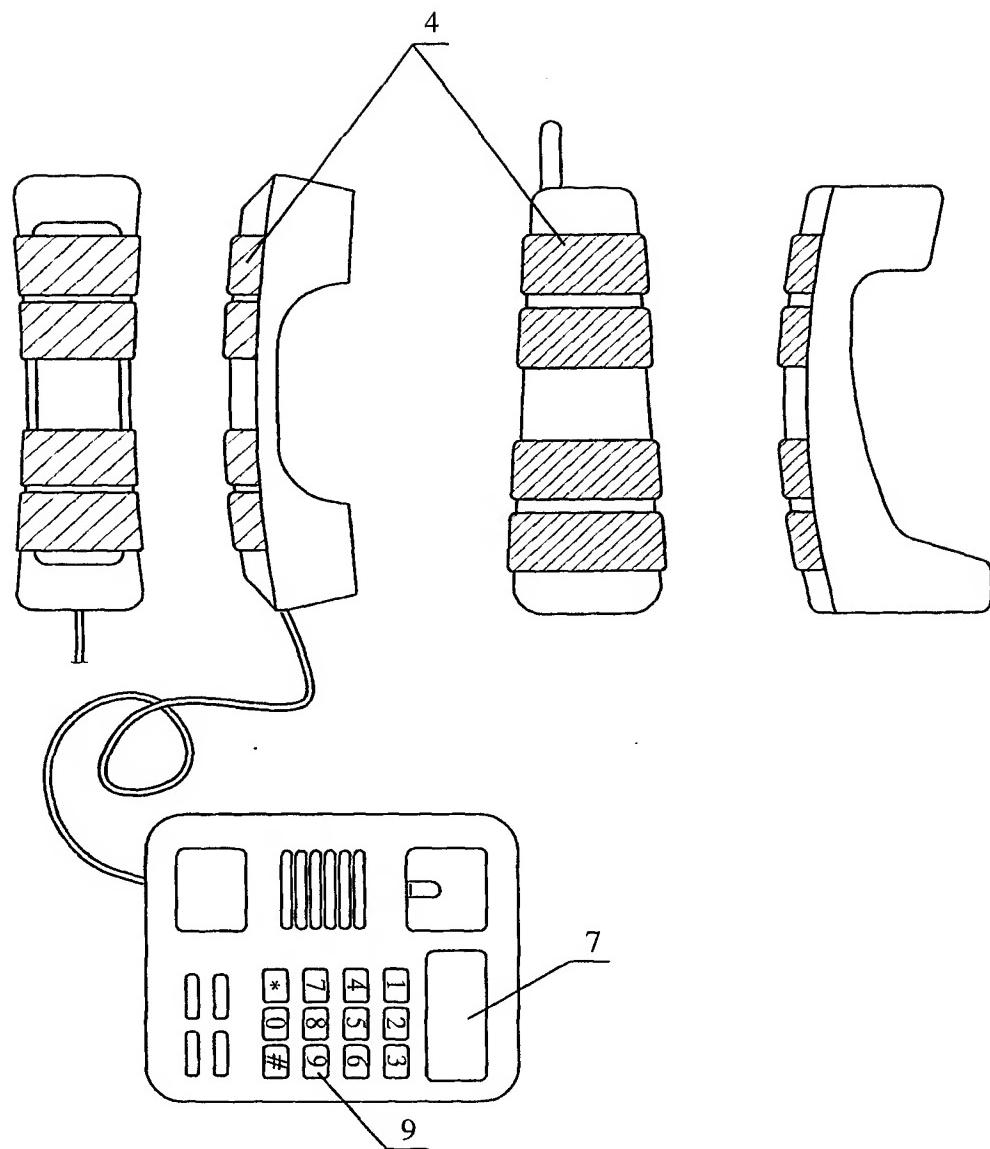
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FIG 1



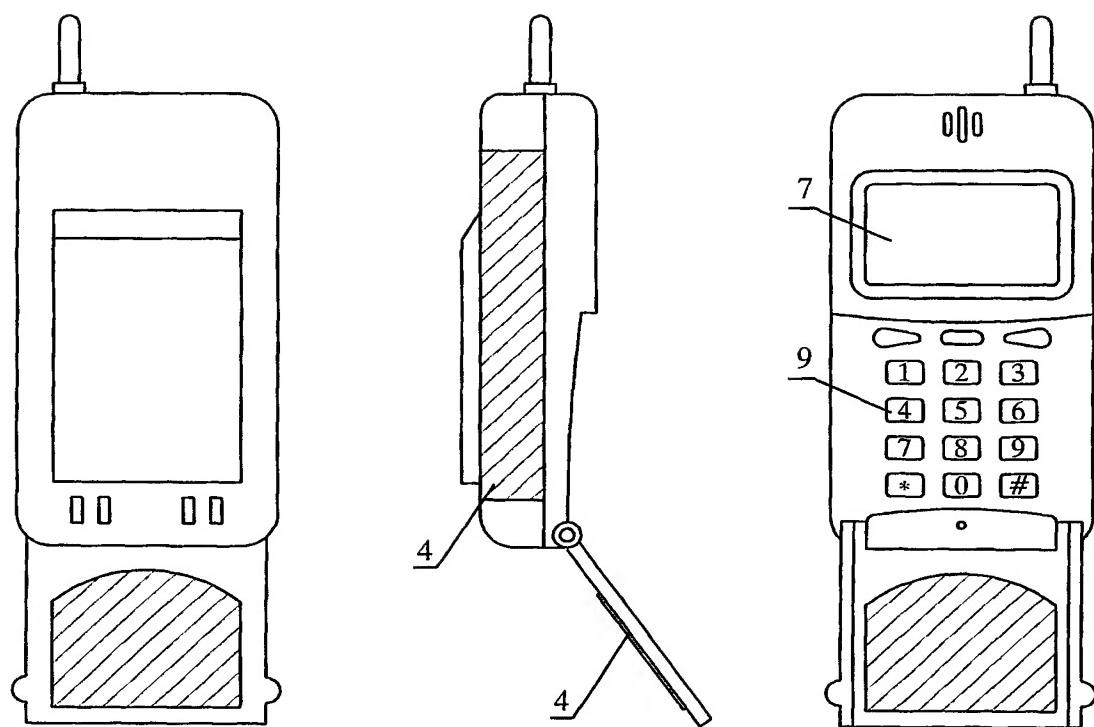
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FIG 2



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FIG 3



## INTERNATIONAL SEARCH REPORT

International application No.  
PCT/KR01/00486

**A. CLASSIFICATION OF SUBJECT MATTER****IPC7 H04M 11/06**

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)

A61B 5/00, H01Q 1/24, H04M 11/06, H04M 11/00

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	JP 10-137197 A ( YAMAMOTO MASUO ) 26 MAY 1998 See the whole document	1
Y	JP 5-49603 A ( FUJITSU GENERAL LTD. ) 02 MARCH 1993 See the whole document	1
A, P	JP 12-216610 A ( NEC CORP. ) 04 AUGUST 2000 See the whole document	1

 Further documents are listed in the continuation of Box C. See patent family annex.

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- "P" document published prior to the international filing date but later than the priority date claimed

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- "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
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